

## Cometary Observations at the Liverpool Observatory, 1902-3. By W. E. Plummer.

June 1904. Mr. Plummer, Cometary Observations.

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## Comet 1903 II. (1902 a), Giacobini.

Greenwich Mean Time of Observation 1902.			—* R.A.	No. of Comp.	Apparent R.A. of	App. Decl. of	No. of Comp.	Log. Factor of Parallax in a.	Star of Comp.	
1902	h m	m s	— 1 20°38	Ret.	7 17 28.19	+ 1 24°7	Ret.	— 1 51 47°0	— 0.4801	0.8564
Dec. 3	12 10	6.2								
6	11 43	16.0	+ 54°33	...	7 16 36.35	— 1 31.0	...	— 1 26.32°9	— 0.5161	0.8543
11	12 22	29.4	— 1 6.31	...	7 14 44.97	+ 1 51.1	...	— 0 38 14°6	— 0.3188	0.8513
11	12 22	29.4	+ 1 44°01	...	7 14 44.83	— 2 45.4	...	— 0 38 15.5	— 0.3188	0.8513
23	9 40	22.9	— 19°74	...	7 8 32.20	+ 6 0.3	...	+ 1 46 13°9	— 0.6097	0.8396
1903										
Jan. 16	8 40	5.2	— 34°35	...	6 51 37.31	— 16.5	...	+ 8 34 6.0	— 0.5139	0.8028
21	10 2	5.0	— 55°25	...	6 48 7.57	+ 3 33°2	...	+ 10 13 24.4	— 0.0253	0.7796
23	9 21	6.3	+ 14°49	...	6 46 50.64	— 2 1.3	...	+ 10 52 38.3	— 0.2510	0.7771
Feb. 17	9 0	13.2	+ 9.69	...	6 36 44.40	+ 6 48.8	...	+ 18 59 21.9	+ 0.3472	0.6948
20	9 11	16.5	+ 55°28	...	6 36 31.62	— 9 56.6	...	+ 19 53 17.2	+ 0.9086	0.6861

## Comet 1903 I. (1903 a), Giacobini.

Jan.	21	6 33 14.0	† 44°80	10	22 59 52.57	— 1 36.5	5	+ 2 44 45.5	0.6070	0.8385
	23	6 35 40.3	— 39°96	10	23 2 2.94	+ 0 20.8	5	+ 3 13 44.6	0.6191	0.8360
	28	6 10 59.7	+ 1 34°40	10	23 7 52.42	+ 1 53.1	5	+ 4 30 34.6	0.6029	0.8298
	28	6 10 59.7	— 10°74	10	23 7 52.37	— 5 35.9	5	+ 4 30 35.3	0.6029	0.8298
	29	6 20 26.2	+ 11°99	Ret.	23 9 7.74	+ 0 57.7	Ret.	+ 4 46 55.0	0.6274	0.8303

Greenwich Mean Time of Observation 1903.		Φ - * R.A.		Apparent R.A. of Φ		No. of Comp.		Φ - * Decl.		App. Decl. of Φ		Log. Factor of Parallax in δ.		Star of Comp.		
		h	m	s	h	m	s	°	'	''	°	'	''	°	'	
Feb.	3	6	32	19.1	+ 21.35	10	23	15	44.61	- 7	49.9	5	+ 6	12	38.3	
	12	6	30	43.0	- 2 3.50	10	23	29	19.25	- 3	25.5	5	+ 9	5	37.6	
	17	6	39	36.5	- 39.19	12	23	37	51.92	- 11	38.8	4	+ 10	52	12.5	
	17	6	41	29.8	+ 18.72	12	23	37	52.04	+ 9	53.0	4	+ 10	52	14.8	
	24	6	40	52.9	+ 2 14.39	10	23	51	1.30	+ 5	3.2	5	+ 13	29	57.3	
	24	6	40	52.9	+ 1 41.54	10	23	51	1.27	- 7	30.8	5	+ 13	29	54.0	
	Mar.	6	6	41	16.0	+ 15.40	10	0	11	14.51	- 9	56.2	5	+ 16	51	32.5
	7	6	50	3.2	- 53.89	10	0	13	11.74	+ 2	27.7	5	+ 17	4	29.6	
	10	6	50	0.4	- 3 21.51	10	0	18	35.73	+ 2	41.0	5	+ 17	24	40.0	
	11	6	52	5.6	- 1 45.26	10	0	20	11.99	+ 1	25.1	5	+ 17	23	23.9	
12	6	51	53.0	- 1 18.85	10	0	21	40.42	- 4	20.7	5	+ 17	16	59.3	0.7393	
						10	21	18	18.87	- 7	28.0	5	+ 18	5	6.9	0.8168

Comet 1903 IV. (1903 e), Barrely.

June	22	12	43	1.1	+ 45.90	12	21	51	55.20	+ 7 33.7	6	- 7	18	34.2	- 0.6114	0.8698	26
	28	12	2	35.3	- 5.57	10	21	45	12.49	+ 7 42.2	4	- 0	55	28.7	- 0.6232	0.8512	27
	28	12	2	35.3	+ 2 54.20	10	21	45	12.39	+ 2 48.2	4	- 0	55	28.4	- 0.6232	0.8512	28
	29	11	47	22.9	+ 1 33.21	8]	21	43	32.27	+ 3 41.5	4	+ 0	28	12.2	- 0.6364	0.8575	29
July	1	11	48	26.0	- 4 11.13	10	21	35	25.99	- 5 31.4	5	+ 3	41	36.7	- 0.6130	0.8338	30
	7	11	10	46.9	- 2 22.22	10	21	18	19.09	+ 2 8.5	5	+ 18	5	2.3	- 0.6294	0.7524	31
	7	11	10	46.9	- 6.04	10	21	18	18.87	- 7 28.0	5	+ 18	5	6.9	- 0.6294	0.7524	32

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Greenwich Mean Time of Observation 1903.	No. of Comp.	Apparent R.A. of	No. of Comp.	App. Decl. of	Log. Factor of Parallax in $\delta$ .	Star of Comp.								
h	m	s	h	m	s	h	m	s	h	m	s	h	m	s
July 10 10 40 16.3	8	20 58 15.93	+ 2 22.3	4	+ 29 9 18.0	-0.6642	0.6534	33						
10 10 40 16.3	8	20 58 15.96	- 5 50.1	4	+ 29 9 18.4	-0.6642	0.6534	34						
13 10 30 22.5	10	20 23 31.32	+ 3 55.1	5	+ 43 9 12.8	-0.6733	0.3822	35						
15 9 40 14.2	8	19 45 10.23	+ 10 22.3	4	+ 52 58 55.7	-0.7655	0.0432	36						
16 9 32 11.0	10	19 17 56.67	+ 4 25.2	5	+ 57 39 26.2	-0.7624	9.2314	37						
22 10 5 20.8	10	14 37 39.60	- 4 4.0	5	+ 67 44 59.9	1.0170	-9.8115	38						
24 9 42 16.0	8	13 30 17.97	- 2 20.7	4	+ 64 38 42.0	1.0334	9.8676	39						
26 9 40 46.4	10	12 47 8.17	- 24.1	5	+ 60 57 12.0	1.0177	0.3291	40						
26 9 40 46.4	10	12 47 8.50	+ 6 9.5	5	+ 60 57 13.6	1.0177	0.3291	41						
28 9 32 19.0	12	12 18 54.25	- 5 21.4	4	+ 57 25 47.2	0.9847	0.4871	42						
28 9 31 26.3	10	12 18 53.97	+ 6 48.4	4	+ 57 25 49.3	0.9847	0.4871	43						
29 9 21 11.2	8	12 8 17.40	- 11 45.4	4	+ 55 48 32.9	0.9674	0.5207	44						
9 16 15.0	10	11 32 59.56	+ 55.3	5	+ 49 0 36.3	0.9039	0.6903	45						
4 9 29 20.9	10	11 27 59.62	- 9 11.6	5	+ 47 52 7.8	0.8897	0.7290	46						
4 9 29 20.9	10	11 27 59.54	+ 5 22.1	5	+ 47 52 7.9	0.8897	0.7290	47						
6 9 18 26.3	12	11 19 15.50	+ 4 1.0	5	+ 45 47 9.7	0.8689	0.7520	48						
9 9 19 59.0	10	11 7 59.71	- 50.6	5	+ 42 57 48.9	0.8377	0.7934	49						
10 9 24 30.4	8	11 4 32.96	- 4 14.2	4	+ 42 4 44.0	0.8239	0.8092	50						
12 9 16 28.3	10	10 58 0.62	+ 3 3.4	5	+ 40 22 7.4	0.8080	0.8217	51						

## Stars of Comparison. Comet 1903 II.

Date. 1902.	Star's Designation or Authority for Place.	Mean R.A. Equinox of Year. h m s	Correction to Mean R.A. s	Mean Declination Equinox of Year. ° ' "	Correction to Mean Declination.
Dec. 3	A.G.Z. Nicolajew, No. 2150	... 7 18 44.33	+ 4.24	- 1 52 59.3	- 12.4
6	A.G.Z. " No. 2132	... 7 15 37.70	+ 4.32	- 1 24 49.1	- 12.8
11	A.G.Z. " No. 2134	... 7 15 46.84	+ 4.44	- 0 39 51.9	- 13.8
11	Gottingen, No. 2436-7	... 7 12 56.37	+ 4.45	- 0 40 47.2	- 13.7
23	A.G.Z. Albany No. 2688	... 7 8 47.19	+ 4.75	+ 1 40 29.0	- 15.7
1903.					
Jan. 16	A.G.Z. Leipzig II., No. 3378	... 6 52 9.74	+ 1.92	+ 8 34 35.1	- 12.6
21	A.G.Z. Leipzig I., No. 2571	... 6 49 0.89	+ 1.93	+ 10 10 3.9	- 12.7
23	A.G.Z. Leipzig I., No. 2542	... 6 46 34.21	+ 1.94	+ 10 54 52.3	- 12.7
Feb. 17	A.G.Z. Berlin A., No. 2328	... 6 36 32.87	+ 1.84	+ 18 52 44.4	- 11.3
20	A.G.Z. Berlin A., No. 2318	... 6 35 34.54	+ 1.80	+ 20 3 24.7	- 10.9

## Comet 1903 a.

Jan. 21	A.G.Z. Albany, No. 7960	... 22 59 8.05	- 0.28	+ 2 46 19.2	+ 2.8
23	A.G.Z. " No. 7979	... 23 2 43.18	- 0.28	+ 3 13 21.2	+ 2.6
28	A.G.Z. " No. 8002	... 23 6 18.30	- 0.28	+ 4 28 39.1	+ 2.4
28	A.G.Z. " No. 8010	... 23 8 3.39	- 0.28	+ 4 36 8.8	+ 2.4
29	A.G.Z. " No. 8019	... 23 8 56.03	- 0.28	+ 4 45 55.0	+ 2.3
Feb. 3	A.G.Z. Leipzig II., No. 11610	... 23 15 23.53	- 0.27	+ 6 20 26.2	+ 2.0

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Date, 1903.	Star's Designation or Authority for Place.	Mean R.A. Equinox of Year.			Mean Declination Equinox of Year.	Correction to Mean Declination.	No. of Refer- ence.
		h	m	s			
Feb. 12	A.G.Z. Leipzig II., No. 11703 ...	23	31	22.99	-0°24'	+ 9° 9' 1.8"	17
17	Rumker, No. 11503 ...	23	38	31.33	-0°22'	+ 11° 3' 50.2"	18
17	A.G.Z. Leipzig I., No. 9407 ...	23	37	33.55	-0°23'	+ 10° 42' 20.7"	19
24	A.G.Z. , No. 9476 ...	23	48	47.11	-0°20'	+ 13° 24' 53.5"	20
24	A.G.Z. , No. 9482 ...	23	49	19.93	-0°20'	+ 13° 37' 24.2"	21
Mar. 6	A.G.Z. Berlin A, No. 47... ...	0	10	59.26	-0°15'	+ 17° 1' 28.9"	22
7	A.G.Z. , No. 65... ...	0	14	57.78	-0°15'	+ 17° 2' 2.2"	23
10	A.G.Z. , No. 100 ...	0	21	57.38	-0°14'	+ 17° 21' 59.6"	24
11	" , " , ...	... ...	... ...	... ...	-0°13'	... ...	24
12	A.G.Z. , No. 109 ...	0	22	59.40	-0°13'	+ 17° 21' 20.9"	25

  

Date, 1903.	Star's Designation or Authority for Place.	Mean R.A. Equinox 1903.			Mean Declination Equinox, 1903.	Correction to Mean Declination.	No. of Refer- ence.
		h	m	s			
June 22	A.G.Z. Ottak, 85, 166 ...	21	51	6.90	+2°40'	- 7° 26' 24.6"	26
21	A.G.Z. Nicolajew, No. 5517 ...	21	45	15.46	+2°60'	- 1° 3' 26.8"	27
21	" , No. 5512 ...	21	42	15.59	+2°60'	- 0° 58' 32.5"	28
29	" , No. 5510 ...	21	41	56.42	+2°64'	+ 0° 24' 14.8"	29
July 1	A.G.Z. Albany, No. 7590 ...	21	39	24.41	+2°71'	+ 3° 46' 52.9"	30
7	A.G.Z. Berlin A, No. 8737 ...	21	20	38.35	+2°96'	+ 18° 2' 40.3"	31

## Stars of Comparison. Comet 1903 IV.

Date, 1903.	Star's Designation or Authority for Place.	Mean R.A. Equinox 1903. h m s	Mean P.A. s	Correction to Mean Declination.	Mean Declination Equinox, 1903. ° ' "	No. of Reference.
July 7	A.G.Z. Berlin A., No. 8720 ...	21 18 21.94	+297	+18 12 21.4	+13.5	32
10	A.G.Z. Camb., Eng., No. 12034 ...	20 58 23.48	+314	+29 6 43.0	+12.7	33
10	" " No. 12017 ...	20 57 37.18	+315	+29 14 55.8	+12.7	34
13	A.G.Z. Bonn, No. 14257 ...	20 24 53.59	+338	+43 5 4.8	+12.9	35
15	A.G.Z. Camb., U.S.A., No. 6218 ...	19 46 44.03	+352	+52 48 19.2	+14.2	36
16	A.G.Z. Hels. No. 10424 ...	19 19 39.27	+355	+57 34 45.6	+15.4	37
22	A.G.Z. Christiania, No. 2207 ...	14 46 41.10	+0.33	+67 48 47.7	+16.2	38
24	A.G.Z. Hels. No. 7596 & Chris. No. 2013	13 26 37.40	-0.31	+64 40 51.3	+11.4	39
26	A.G.Z. Hels. Gotha, No. 7329 ...	12 45 55.34	-0.31	+60 57 28.3	+7.8	40
26	" " No. 7318 ...	12 44 25.91	-0.31	+60 50 56.5	+7.6	41
28	" " No. 7120 ...	12 16 37.75	-0.24	+57 31 3.7	+4.9	42
28	" " No. 7156 ...	12 20 24.87	-0.21	+57 18 55.7	+5.2	43
29	" " No. 7030 ...	12 3 15.74	-0.20	+56 0 14.8	+3.5	44
Aug. 3	Bonn, No. 8110 ...	11 30 4.15	+0.06	+48 59 41.6	-0.6	45
4	" No. 8099 ...	11 28 19.52	+0.09	+48 1 20.4	-1.0	46
	" No. 8072 ...	11 28 1.47	+0.10	+47 46 47.1	-1.3	47
6	" No. 8036 ...	11 22 32.46	+0.17	+45 43 10.7	-2.0	48
9	" No. 7956 ...	11 10 28.67	+0.25	+42 58 43.1	-3.6	49
10	Differenced from Bonn, No. 7966 ...	11 11 32.19	+0.27	+42 15 7.9	-3.7	50
12	A.G.Z. Bonn, No. 7891 ...	11 0 42.93	+0.33	+40 19 9.0	-5.0	51